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Redacted Disclosure

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Disciplines

Accounting

Redacted Disclosure

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In this paper we investigate a firm's decision to redact proprietary information from its material contract filings. Information redaction results when the Security and Exchange Commission (SEC) grants a firm's request to withhold information from investors in its material contract filings, presumably because the information is proprietary. We hypothesize that when firms redact information, measures of adverse selection deteriorate. That is, the redaction of proprietary information from material contracts should be associated with: a larger adverse selection component of the bid-ask spread; reductions in market depth; and lower market turnover. In addition, we conjecture that the decision to redact depends on whether the firm plans on raising capital, the competitiveness of the firm's industry, and the performance of the firm. Overall the results of our analysis generally support our predictions. We find that when firms redact information, contemporaneous measures of the adverse selection component of the bid-ask spread rise, and market depth and share turnover deteriorate; this suggests an increase in adverse selection. We also find firms are less likely to redact when they issue long term debt, and are more likely to redact when they are in a competitive industry or experience losses.

1. Introduction

An economic consequence commonly associated with a firm's disclosure choice is the severity of the adverse selection problem inherent in the buying and selling of firm shares. For example, decreased disclosure should exacerbate adverse selection, thereby increasing the extent to which parties to a transaction involved in the purchase or sale of firm shares need to price-protect themselves. Adverse selection severity should be manifest in a variety of market proxies, such as bid-ask spreads, market depth, and share turnover. In addition, it should be associated with that part of the firm's cost of capital that arises from information asymmetry between the firm and its shareholders, and/or among investors.¹

Despite these claims, recent work posits that when firms report under US Generally Accepted Accounting Principles (US-GAAP), the richness of the information environment may preclude finding a relation between a firm's disclosure choice and the economic consequences related to that choice.² This is likely the cause of the mixed results from research that explores the association between the cost of capital and disclosure.³

For example, Botosan (1997) finds that there is a significant relation between her measure of the extent of disclosure and the cost of capital, but this relation only exists for firms that have low analyst following. Botosan and Frost (1998), using a similar disclosure metric, find that foreign firms that trade in U.S. equity markets and make more timely disclosures have higher liquidity. They do not find results on the level of

¹ See, for example, Diamond and Verrecchia (1991) and Verrecchia (2001).

² See, for example, Leuz and Verrecchia (2000) and Verrecchia (2001).

³ Leuz and Verrecchia (2000) provide evidence that measures of accounting quality are associated with measures of the cost of capital in Germany's Neuer market.

disclosure and the cost of capital. Sengupta (1998) investigates whether disclosure is associated with the cost of debt, and finds that firms that have higher analyst disclosure ratings have lower costs of debt. Welker (1995) and Healy, Hutton, and Palepu (1999) find a similar association between the cost of equity capital and analyst ratings. Leuz and Verrecchia (2000), however, highlight the difficulty in drawing inferences from associations between analyst ratings and cost of capital, in that analyst ratings only measure an analyst's perception of the quality of the firm's disclosure.

In an attempt to find a disclosure choice under US-GAAP that may lead to a relation between that choice and a firm's cost of capital through adverse selection, we consider firms that withhold proprietary information from investors by redacting the information from their material contract filings.⁴ Regulation S-K requires all material contracts or agreements into which a firm enters to be filed with its 8K, 10K, 10Q, or registration statements.⁵ If a contract is definitively material in that all of the firm's auditors, the SEC, and plaintiffs bar conclude that an average investor ought to be informed, then the firm must disclose the contract. The SEC does provide firms, however, with an element of discretion by allowing firms to request that proprietary information contained within the contract be withheld.⁶ If the SEC grants the firm's request for confidentiality, investors and other financial statement users will have no access to the redacted data (although the SEC will). By redacting data, firms are able to

⁴ Carter and Soo (1999) examine the information content of 8k disclosures and find that the market does react to the information in the 8k (either shortly before the 8k is filed, or on the filing date). One piece of information that can be contained in an 8k is a material contract. Thus this study implies that the market considers material contracts to be value relevant.

⁵ For a more precise description of the SEC's regulations regarding the filing of material contracts see Regulation SK subpart 229.600 - Exhibits. An electronic version of regulation SK can be found at <http://www.sec.gov/divisions/corpfin/forms/regsk.htm>

⁶ Rule 406 under the Securities Act of 1933 and Rule 24b-2 under the Securities Exchange Act of 1934 provide a detailed description of when, how, and the process a firm must go through to request to have information redacted from a filing.

avoid disclosing information that they deem proprietary, thereby reducing the overall amount of information that is disclosed to the public. Over the past decade requests for confidential treatment have burgeoned, even though the Freedom of Information Act (FOIA) makes it difficult for firms to withhold redacted information indefinitely.

For example, in a recent legal bulletin by the SEC's Division of Corporate Finance, the SEC indicates that "in recent years, the number of confidential treatment requests ('CTRs' or 'applications') processed by the Division has increased steadily from approximately 540 in fiscal year 1992 to more than 1,000 in fiscal year 1996."⁷ A text search of Lexis-Nexis for the year 2000 using the phrase "confidential treatment" indicates that as many as 4000 documents filed in association with the firm's 10K mention confidential treatment. So as to avoid having to disclose these contracts under the FOIA, the SEC states: "most applicants rely on the [FOIA] exemption that covers trade secrets and commercial or financial information obtained from a person and privileged or confidential."⁸

In light of firms applying for and receiving confidential treatment in the presence of materiality, there may exist substantial heterogeneity in the quality and quantity of information disclosed in the material contract portion of the firm's financial statements. We provide evidence on the consequences of the decision to reduce disclosure by investigating how the redaction of material contract information from financial reports affects firms' proxies for adverse selection. We also investigate possible determinants of the decision to redact financial information from a firm's financial reports.

⁷ See the SEC's Division of Corporation Finance Staff Legal Bulletin No. 1 (with Addendum) "Confidential Treatment Requests" Action: Publication of CF Staff Legal Bulletin, February 28, 1997.

⁸ Division of Corporation Finance Staff Legal Bulletin No. 1 (1997).

Redaction allows firms with “bad news” to pool with firms with “better news,” but not sufficiently better to warrant bearing the proprietary costs associated with full disclosure (e.g., Verrecchia, 1983). This creates adverse selection in the market for firms’ shares. For example, we predict that firms that choose to redact information encounter higher adverse selection through: a larger adverse selection component of the bid-ask spread; smaller quoted dollar-depths; and lower share turnover. We also hypothesize that firms are less likely to redact information in years in which they issue stock or public debt. Finally, we hypothesize that the degree of competition in a firm’s product markets and the profitability of the firm affect the decision to redact information.

We use the material contract disclosures in the 10K to identify firms that redact material contract information from their financial reports. We focus our analysis on small, publicly traded, non-financial companies that filed at least one material contract during fiscal 2001. We focus on small firms for two reasons. First, small firms are less likely to be followed by analysts, and are less likely to have competing sources of information available. Thus, the redaction of proprietary information is likely to be a more significant event. Second, we hand-collect redaction data. This precludes us from using a large sample of firms and examining the effects of firm size.

We find that slightly more than 15% of the firms in our sample elected to redact information from their material contract disclosures during the fiscal year 2001, and over 25% of our firms disclosed that they had redacted information from at least one material contract in the past. These statistics suggest that there is a significant amount of variation in the extent of the disclosure of material contract information.

We find that the adverse selection component of the firm's bid-ask spread is larger when the firm redacts material contract information. We also find that the quoted dollar depth and share turnover decrease when firms redact information from their material contract filings. In addition, we provide preliminary evidence on the determinants of the decision to redact information. We find that firms are less likely to redact financial information when they issue long term debt. We also find that firms are more likely to redact when they have suffered financial losses. Both of these results are consistent with the extant literature that finds that disclosure is associated with the propensity to raise capital and firm profitability.

We also find that firms are less likely to redact information when they face less competition. In their review article on the empirical disclosure literature, Healy and Palepu (2001) posit that there is little evidence on the relationship between competition and disclosure. Thus, our results on industry competition are potentially interesting as they provide some insight into how competition affects disclosure choices.

We conclude our analysis by investigating whether our results are attributable to a self-selection bias. Using the Heckman self-selection correction methodology (Heckman, 1976), we find that for two of our three adverse selection measures (the adverse selection component of the bid-ask spread and dollar depth), the potential bias does not affect our results. The results on share turnover are insignificant after controlling for self-selection. This suggests that the type of firm that redacts information affects share turnover. Finally, in untabulated sensitivity analyses we investigate whether these results are sensitive to alternative adverse selection measures and alternative measures of the extent

of redaction; we find that our results are not sensitive to these alternative research design choices.

Overall, the results of this paper indicate that there is a relation between a firm's decision to redact material contract disclosures and measures of adverse selection even though US GAAP effectuates a rich disclosure environment. In addition, we find that small firms are more likely to redact when they are in more competitive industries.

The rest of this paper is organized as follows. In Section 2 we state our hypotheses, and in Section 3 introduce the instruments used to test them. In Section 4 we discuss the sample selection procedures, and in Section 5 provide a detailed explanation of the research design. Section 6 discusses results, and Section 7 offers concluding comments.

2. Hypothesis Development

Our hypotheses about the effects of redacting proprietary information from a firm's material contract filings are based on conventional notions of how disclosure affects trade in firm shares. Redaction provides a refuge, or "safe harbor," for firms with "bad news" to pool with firms with "better news" by appealing to the rationale that the news is proprietary. This exacerbates adverse selection, thereby increasing the extent to which parties to a transaction involved in the purchase or sale of firm shares need to price-protect themselves.

The literature offers a variety of ways to measure adverse selection. The measures we examine are bid-ask spreads, market depth, and share turnover. Jaffe and Winkler (1976) and Stoll (1978) argue that the firm's bid-ask spread is related to the extent of information asymmetry about the firm. They assert that market makers face

potential losses when trading against informed investors. To protect themselves from these losses, market makers increase bid-ask spreads as the probability that they are trading against informed investors increases. Glosten and Harris (1988) introduce a methodology to identify the adverse selection component of the bid-ask spread. We use this methodology to develop our bid-ask spread measure.

Easley, Kiefer, O'Hara, and Paperman (1996) and Leuz and Verrecchia (2000) suggest that share volume is related to costs that arise from adverse selection. Illiquid stocks have large variation in order flow; active days are interspersed with slow days. If private information motivates trades on active days, market makers could be subject to large losses. This suggests that firms with low trade volumes are more likely to experience costs related to adverse selection. We use this methodology to develop our share turnover measure.

Lee, Muckalow, and Ready (1994) and Callahan, Lee, and Yohn (1996) assert that in addition to bid-ask spreads, market makers adjust market depth to reduce the costs associated with traders that have an informational advantage. That is, when market makers are more likely to be trading against investors with superior information, market makers have an incentive to reduce the number of shares they are willing to trade at the quoted prices. By reducing depth, market makers can reduce their exposure to trading against informed traders. Consistent with this conjecture, Heflin and Shaw (2001) find a significant negative correlation (75%) between the adverse selection component of the firm's bid-ask spread and quoted depth. We follow Rogers (2005), and use quoted dollar depths as our depth measure.

Our first hypothesis is that these three measures (i.e., the adverse selection component of their bid-ask spreads, share turnover, and quoted market depths) deteriorate when firms redact information from their disclosures.

We also examine the determinants of the decision to redact. Here, we rely primarily on the hypotheses developed in the extant literature for the factors that are expected to affect the decision to disclosure. For example, we hypothesize that the decision to redact material contract information depends on whether the firm plans to issue stock or debt. Lang and Lundholm (1993, 1997), Frankel et al. (1995), and Sengupta (1998) find that firms increase disclosure or provide higher quality disclosures in anticipation of upcoming public debt or equity offerings. These studies imply that firms are less likely to redact information if they plan a public debt or equity offering in the future.

Next, we hypothesize that the decision to redact information depends on competitiveness in a firm's product market. The theoretical literature offers conflicting arguments as to how competition affects the firm's decision to disclose proprietary information. Darrough and Stoughton (1990) argue that greater competition fosters greater disclosure as a device to thwart entry into a product market. Alternatively, Verrecchia (1990) argues that greater competition inhibits disclosure in markets comprised of mature competitors (i.e., post-entry). Healy and Palepu (2001) posit that the empirical literature offers little direct evidence on how competition affects the decision to disclose proprietary information (pg 424). This may be in part attributable to the difficulty in measuring proprietary costs. The conflicting theoretical predictions, in combination with the absence of empirical evidence on how competition affects

disclosure, suggests that it is not clear how competition affects a firm's decision to redact material contract information.

Our final hypothesis is that firm performance affects the decision to redact information. Lang and Lundholm (1993) argue that it is not clear how firm performance affects the decision to disclose. Profitable firms may choose not to disclose because disclosure encourages entrance and competition. Alternatively, if there are costs to disclosure, then more profitable firms have stronger incentives to disclose and reduce costs that result from adverse selection. Thus, it is not clear whether performance is positively or negatively associated with the extent of disclosure. In the next section we develop instruments to test our hypotheses.

3. Proxy Development

In the previous section we hypothesize that redaction affects adverse selection. To determine whether firms redact information from their material contract filings, we must first determine whether a firm has entered into a material contract, and then determine whether the firm has redacted information from the contract. Firms enter into material contracts throughout the year. The SEC requires that when a firm enters into a material contract, they file an 8K. Practically, instead of filing an 8K, many firms elect to disclose the existence of the contract in their next SEC filing. Thus material contracts are often filed with the firms 10K, 10Q, registration statements, 8K, proxy statements, etc.

Fortunately, to determine whether a firm filed a material contract we do not have to search each SEC filing. Instead, the SEC requires each firm to maintain an exhibit list of all material contracts that the firm has entered into in the past year.⁹ This exhibit list

⁹ The exhibit list also includes a reference to all unexpired material contracts that the firm has entered into in the past.

can usually be found under item 14 in the firm's 10K.¹⁰ We use the exhibit list to identify all material contract filings made by the firm starting the first day of fiscal 2001 and ending three months after the last day of fiscal 2001. Material contracts are always filed as exhibit 10.XXX, where the XXX is the exhibit number. The exhibit list typically reports the nature of the contract, whether the firm has requested confidential treatment, and the filing in which the material contract was disclosed. We use this exhibit list to determine whether firms redact information from their filings.

For each firm's 2001 fiscal year we go through the exhibit index and identify all material contracts the firm filed starting with the first day of fiscal 2001, and ending three months after the last day of fiscal 2001. We then identify all material contracts in which the firm was granted a request for confidential treatment. Typically, one can quickly identify a contract that was redacted by searching for the phrase "Confidential treatment." We then create an indicator variable, *Redactdum*, that is one for each firm that filed a request confidential treatment for material contract information during the 15 month period beginning the first day of fiscal 2001 and ending three months after the last day of fiscal 2001, and is zero otherwise.¹¹

As we discuss above, we employ three measures of adverse selection. The first measure is the adverse selection component of the bid-ask spread. To calculate the bid-

¹⁰ See Section 66000 of regulation S-K entitled Exhibits (Item 601) for the SEC's rules regarding the filing of material contracts.

¹¹ To identify the date that the market learns that the firm requested confidential treatment for a material contract, we started with the exhibit list to identify requests for confidential treatment and the relevant SEC filing in which the material contract was filed. We then used Lexis/Nexis to obtain the date of the filing that first mentions the material contract with redacted data. Firms often file material contracts multiple times, thus there may be several filings mentioning the redacted contract. Thus, to ensure that we properly identified the first mention of the redacted contract, for each firm with a redacted contract, we searched the firm's 10K, 10Q, 8K, and registration statements using the phrase "confidential treatment" for fiscal years 2000, 2001 and 2002. This procedure allowed us to identify several instances where the exhibit list did not correctly identify the first filing of the redacted contract.

ask spread for each firm, we follow the methodology suggested in Glosten and Harris (1988). We start by collecting all of the quote data on the TAQ database for the 15-month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. We focus on this sample period to ensure that our spread variable reflects any material contract disclosed in a fiscal year 2001 SEC report. We eliminate any trades that did not occur on the NYSE, AMEX, or NASDAQ exchanges. We also eliminate any quotes that were not made under normal market conditions (i.e., all quotes that do not have a mode=12 on the TAQ database). We also eliminate all aggregate quotes, and all quotes that occur outside normal trading hours. We follow a similar procedure for the trade data, and then use the procedure suggested by Lee and Ready (1991) to match the quote data and the trade data. We then run the following regression for each firm using fifteen months of trade and quote data:

$$\Delta Price_t = C_0 \Delta Quote_t + C_1 \Delta Quote_t Trdsize_t + Z_0 Quote_t + Z_1 Quote_t Trdsize_t + \varepsilon.$$

where:

Price is the observed transaction price,

TrdSize is number of shares traded in the transaction at time t, and

Quote is an indicator that is equal to +1 if the quote is classified as buyer initiated and -1 if the transaction is seller initiated (we use the methodology proposed in Lee and Ready (1991) to classify trades as buys or sells.)

Glosten and Harris indicate that the adverse selection component of a particular trade is calculated as $2(Z_0 + Z_1 * Trdsize_t)$. We express adverse selection as a proportion of the spread. Thus for each firm we calculate the average trade size and calculate the ratio:

$$\frac{2(Z_0 + Z_1 * AvgTrdsize_t)}{2(Z_0 + Z_1 * AvgTrdsize_t) + 2(C_0 + C_1 * AvgTrdsize_t)},$$

where the numerator is the adverse selection component associated with the average trade and the denominator is the bid-ask spread for the average trade. We define the variable *Adv_select* to be equal to this ratio.

Our second proxy for adverse selection is the firm's quoted market depth expressed in dollars. To calculate the firm's dollar-depth, we again start by collecting quote data from TAQ for the 15-month period beginning the first day of fiscal year 2001. We eliminate any trades that did not occur on the NYSE, AMEX, or NASDAQ exchanges, and any trades not made under normal market conditions. We also eliminate all aggregate quotes, and all quotes that occur outside normal trading hours. For each resulting transaction we calculate the dollar depth by adding the number of shares offered at the bid multiplied by the bid price, and the number of shares offered at the ask multiplied by the asking price. We divide the resulting sum by 2. The resulting variable is a measure of quoted dollar depth for the transaction. We then calculate the median dollar depth for each firm/day in our sample for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The final variable *\$Depth* is the average of these daily dollar depths.

Our final proxy for adverse selection is a measure of the firm's monthly share turnover for the 15-month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year to measure the liquidity of the firm's stock. We collect the number of shares outstanding and the number of shares traded for each month of our sample period from the CRSP database. We then divide the number of shares traded by the number of shares outstanding; the resulting quotient is our measure of

monthly turnover. Finally, we take the average of the monthly turnover to create the variable, *Monthly_Turnover*.

The literatures of both finance and accounting suggest that market measures of adverse selection are likely to be influenced by factors other than disclosure choices. We construct several control variables to proxy for these other factors. First, consistent with Leuz and Verrecchia (2000) and Chiang and Venkatesh (1993), we control for the size of the firm using the variable *LnMVE*. *LnMVE* is calculated by taking the natural log of the firm's market value as of December 31, 2001. Following Christie and Huang (1992) and Huang and Stoll (1996), we also control for the exchange the firm is traded on by using two indicator variables (*NYSE* and *AMEX*). These variables equal one if a firm is traded on the New York Stock Exchange or the American Stock Exchange, respectively, and equal zero otherwise. Third, following Benston and Hagerman (1974) and Coller and Yohn (1997), we control for the firm's share price using the variable *LnPrice*. *LnPrice* is calculated by first taking the firm's average share price for the 15-month period beginning the first day of fiscal year 2001, and ending 3 months after the end of the fiscal year. We then take the natural log of the average share price.

Our analysis of the factors that affect the decision to redact predicts that the redaction decision depends on the firm's propensity to issue capital, the competitiveness of the firm's industry, and the profitability of the firm. We use two different data sources to determine whether firms issue debt or equity. For equity issuances, we use the SDC database of seasoned equity offerings. For debt issuances, we use data item 111 on the Compustat database (long term debt issuances per the financing section of the statement

of cash-flows).¹² We create two indicator variables *Equity_issue* and *Debt-Issue* that are set equal to one if SDC or Compustat indicates the firm issued equity or debt, respectively, and are otherwise zero.

We use the ranks of the Herfindahl index (*Hindex*) to measure the competitiveness of the firm's industry, calculated at the two-digit SIC level. We use the firm's return on assets (*ROA*), and an indicator variable that is one if the firm has suffered a loss (*LOSS*) as proxies for the firm's profitability. We also include controls for size (*LNME*) and the number of exhibits filed in 2001 (*Num_Exhibits*). We expect a mechanical relation between redaction and the number of exhibits filed, as firms that file more exhibits are more likely to have an exhibit that contains proprietary information.

4. Sample Selection

Table 1 describes our sample selection process. We start with the 671 firms on the CRSP database that have a market value of equity between \$50 and \$100 million as of December 31, 2001. We focus on this segment of the market, as there are likely to be relatively few analysts following these firms and limited press coverage. Thus, there is likely to be a relatively larger impact (in terms of adverse selection) when relatively small, publicly traded companies withhold information by requesting confidential treatment.

We then eliminate 56 firms from the sample because they are in the banking industry, and 40 firms that have missing 10K data or exhibit data that is missing from the 10K filing. Banks are eliminated from the sample because they are subject to additional

¹² We did use the SDC database to identify long term debt issuances, and Compustat to identify equity issuances, but both measures were fraught with omissions and coding problems. Compustat lumps equity issuances and stock option exercises together, reducing the usefulness of this data item. SDC often omits long term debt issuances for the small firms that populate our sample. These data problems suggest that our variables may be measured with noise, which should bias against finding results.

regulatory disclosure requirements that are not captured in their SEC filings. Firms that do not have 10K's on Lexis are eliminated as we are unable to determine whether a contract has been redacted for these firms.

For the 575 firms that are left in our sample, then we examine the material contract section to determine whether they have redacted contract information. We found 125 firms that had not made any material filings during the fiscal year 2001. To increase the power of our tests, we eliminate these firms from the sample. That is, firms that do not file any contracts in 2001 cannot make a redaction choice. It is not clear how the market perceives these firms relative to the firms that do disclose material contract, and relative to those that redact. Thus we exclude these firms from our sample. The resulting sample of 450 firms is then merged with TAQ database to obtain data on the bid-ask spread and depth. Of these 450 firms, 427 firms are covered on the TAQ database. Thus, we delete an additional 23 firms from our sample for the analyses that require TAQ data.

Table 2 provides an overview of the industry classification of the 450 firms in our final sample (by two digit SIC Code). Other than SIC code 73, which has roughly 20% of our sample, there does not appear to be a significant clustering in any other industry. To ensure that industry clustering does not drive our results, we include industry controls in our examination of the effect of redaction on adverse selection. Each industry with more than 20 firms has its own indicator variable in that analysis.¹³

4.1 Description of the Types of Exhibits Disclosed or Redacted.

¹³ We replicated all tests in the paper excluding these variables, and our test variables remain statistically significant at conventional levels. It is also important to note that we do not include industry controls in the determinants model, as the Herfindal index is determined at the industry level, and this would be collinear with the industry dummies.

Because we are unaware of any other paper that examines the types of information disclosed as a material contract in the 10K and the types of information redacted from the 10K, Table 3 provides summary level data for our sample. In Panel A we focus on the contracts that were disclosed in the 10K; in panel B we focus on the contracts that were redacted.

We create 9 different categories to describe the types of data disclosed as material exhibits. The first category relates to the debt contracts filed by the firm. In this category we include all debt contracts, loans, waivers, loan amendments, letter agreements, and guarantees.

The second category includes all employment related contracts. This category includes option plans, deferred compensation plans, bonus plans, retirement plans, pension plans, and incentive plans. In addition we also found numerous instances of employment offer letters, union contracts, consulting agreements, severance agreements, change in control agreements, and other employment related contracts.

The third category includes contracts that relate to the sale and/or purchase of assets (other than inventory). In addition to the SEC's guidance on materiality, discussed above, the SEC also indicates that any sale or purchase of assets that is greater than 15% of the firm's fixed assets must be disclosed.¹⁴ The fourth category includes all contracts that relate to the purchase and sale of inventory or services. The fifth category includes all license agreements, and the sixth category includes equity related agreements such as rights agreements, stock purchase or sale agreements, and warrants. The seventh category includes all leases. In each of these categories the SEC provides no guidance on the definition of materiality (other than the general guidance discussed above).

¹⁴ See subpart 229.600 — Exhibits of the SEC's Regulation S-K for this rule.

The eighth category includes all contracts related to mergers and acquisition agreements. Generally, the SEC requires the actual merger agreements to be filed as an Exhibit 2.XXX. There are often ancillary agreements, however, that get filed as material contracts. The final category, other, captures the assortment of miscellaneous contracts filed with the SEC.

Panel A of Table 3 indicates that firms most often file employment related contracts with the SEC followed by debt agreements, miscellaneous agreements, and equity related contracts. Focusing on the total sample, the firms in our sample filed an average of 7 contracts in fiscal 2001.

Panel B of Table 3 indicates that firms seldom redact data from debt related contracts, employment agreements, lease agreements, merger agreements and asset purchase agreements. This is not particularly surprising, as it is difficult to justify that these types of contracts contain proprietary information. Firms most often redact data from the miscellaneous contracts that they file, from their license agreements, and from purchase and sale agreements. These types of contracts are much more likely to contain cost and pricing data that is likely to be proprietary. At the bottom of Panel B we tabulate the number of firms in our sample that redacted data during fiscal year 2001, and find that 74 of the 450 firms in our sample, 16%, elected to redact data. We also examined the exhibit list to determine, historically, how often the firms in our sample redact data. We found that at least 122 of the 450 firms in our sample, 27%, had a request for confidential treatment granted at some point in their history.¹⁵

¹⁵ It is possible that several other firms requested confidential treatment for a contract at some point in their history, and this has not been disclosed in the 10K because the contract is no longer relevant. In this case, in the periods when the contract was relevant, the confidential status would have been disclosed in the exhibit list.

5. Research Design

Our first analysis focuses on the relation between disclosure and adverse selection. That is, we run the following regressions:

$$\text{Adv_Select} = \alpha \text{ Intercept} + \beta_1 \text{ RedactDum} + \beta_2 \text{ LnNumofExib} + \beta_3 \text{ LnMVE} + \beta_4 \text{ NYSE} + \beta_5 \text{ AMEX} + \beta_6 \text{ LNPrice} + \varepsilon \quad (1)$$

$$\text{\$Depth} = \alpha \text{ Intercept} + \beta_1 \text{ RedactDum} + \beta_2 \text{ LnNumofExib} + \beta_3 \text{ LnMVE} + \beta_4 \text{ NYSE} + \beta_5 \text{ AMEX} + \beta_6 \text{ LNPrice} + \varepsilon \quad (2)$$

$$\text{MonthlyTurnover} = \alpha \text{ Intercept} + \beta_1 \text{ RedactDum} + \beta_2 \text{ LnNumofExib} + \beta_3 \text{ LnMVE} + \beta_4 \text{ NYSE} + \beta_5 \text{ AMEX} + \beta_6 \text{ LNPrice} + \varepsilon, \quad (3)$$

where the variables are defined as follows.

Adv_Select - We use the methodology proposed in Glosten and Harris (1988) and the trade identification procedure proposed by Lee and Ready (1991) to calculate the percentage of the spread that is related to adverse selection. We use the in trade and quote data for our sample firms for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

\\$Depth – Calculated using the TAQ quote files. We first calculate the dollar depth for an individual trade by adding the number of shares offered at the bid multiplied by the bid price and the number of shares offered at the ask multiplied by the asking price. We divide the resulting sum by 2. The resulting variable is a measure of quoted \$Depth. Finally, we then calculate the median \$depth for each firm/day in our sample for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The final variable is the average of these daily \$depths.

Monthly Turnover – Calculated by dividing the monthly volume of shares traded by the number of shares outstanding for each firm month for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The average monthly turnover for the firm is then determined.

Redactdum – An indicator variable set equal to one if the firm filed a requests for confidential treatment for the fiscal year 2001, zero otherwise.

Ln(Num of Exib) – Calculated as the natural log of the number of exhibits filed in fiscal 2001.

LN MVE – The natural log of the firm's market value of equity (in \$100,000), calculated on December 31, 2001.

NYSE – Indicator that is one if the firm is traded on the New York Stock Exchange, zero otherwise.

AMEX- Indicator variable that is one if the firm is traded on the American stock exchange, zero otherwise.

LnPrice – The natural log of the median price per share for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

To provide evidence on the determinants of the decision to redact information from the contract, we run the following probit regression:

$$\text{Redactdum} = \alpha \text{ Intercept} + \beta_1 \text{Equity_Issue} + \beta_2 \text{Debt_Issue} + \beta_3 \text{Hindex} + \beta_4 \text{ROA} + \beta_5 \text{Loss} + \beta_6 \text{LnMVE} + \beta_7 \text{Ln(NumofExib)} + \varepsilon, \quad (4)$$

where the variables are defines as follows.

Redactdum - Indicator variable that is 1 if the firm redacted information form a disclosure during fiscal year 2001, 0 otherwise.

Debt_Issue - Indicator variable that is 1 if the firm issued debt during fiscal 2001 (COMPUSTAT data item 111) , 0 otherwise.

Equity_Issue – Indicator variable that is 1 if the firm issued equity during fiscal 2001 (as per the SDC database), 0 otherwise.

Hindex – The rank of the industries Herfindahl index. The Herfindahl index calculated as the sum of the squared market share of each publicly traded company in a particular the 2 digit SIC code. Market share is calculated as the sales of a particular company divided by the total sales of the SIC code.

ROA – Net income/Assets (CMPUSTAT data items 172 and 6).

Loss – Indicator variable that is 1 if the firm had a loss, 0 otherwise.

LN MVE – The natural log of the firm’s market value of equity (in \$100,000), calculated on December 31, 2001.

Ln(Num of Exhib) – Calculated as the natural log of the number of exhibits filed in fiscal 2001.

Our final analysis examines the association between disclosure and measures of adverse selection with controls for self-selection. That is, we use the Heckmen (1976) self-selection correction methodology to control for the determinants of the firm’s decision to disclose or redact financial information. To implement this methodology we first estimate the model of the determinants to redact information (model 4 above). We then calculate the inverse mills ratios from this model and include it in our second stage

model of the determinants of our proxies for the extent of the firm's adverse selection problem.

6. Results

6.1 Descriptive Statistics

Table 4 provides descriptive statistics for our test and control variables. We find that 16% of the firms in our sample issued equity while 44% of the firms issued some form of long term debt (either public or private). We also find that over 60% of the firms in our sample suffered losses in fiscal 2001. The average adverse selection component of the bid-ask spread for our sample firms is 19%. The average quoted dollar-depth for our sample is \$4400. The average monthly turnover of the firm's outstanding shares is approximately 8%. Not surprisingly, these firms have lower depths and share turnover than the average firm on NYSE and NASDAQ. This is primarily attributable to sampling only small firms from these exchanges.

The firms in our sample disclose an average of slightly more than 7 exhibits per year and redact data from 0.44 exhibits per year. Because our sample is comprised of small firms, these averages may be significantly different than those of larger firms.

6.2 Multivariate results

In Table 5, we report our results on the association between our measures of adverse selection and the extent of redacted information. Focusing on the first column of results, the adverse selection component of the firm's bid-ask spread is positively associated with our proxy for the extent of redaction. Market makers penalize trade in firms that redact information from their material contracts by increasing the cost of executing orders. The economic significance of this coefficient suggests that the adverse

selection component of the bid-ask spread is 2% larger for firms that redact information from their material contracts. We also find all of our control variables are significant (other than the number of exhibits filed). Larger firms enjoy less adverse selection. Compared to firms on NASDAQ, firms on NYSE experience less adverse selection while firms on AMEX experience more. We also find that firms with higher prices experience more adverse selection.

The second column of results reports the determinants of quoted depth. Firms that withhold information by redacting data have relatively smaller dollar depths. This suggests that when firms elect to redact information, the market maker responds by reducing the number of shares they are willing to buy or sell at their quoted prices. This implies that redaction of data increases costs that result from adverse selection. The coefficient of 5.99 indicates that the market maker reduces quoted depths by \$599 when firms redact information from their material contracts. We find that larger firms have marginally smaller quoted dollar depths. The relatively small impact of firm size on depth is likely in part driven by the sample selection procedures that limit the size of the firms in this sample. We also find that firms that have higher prices have greater depths.

The third column reports the results on turnover. Firms that redact financial information appear to have lower shareholder turnover than firms that do not. The redaction of information appears to reduce the average monthly turnover by 1%. The control variables for the NYSE and Size are both statistically significant and positive, indicating that the larger firms and firms on NYSE enjoy a more liquid market. The other control variables are not significant. Overall the results from these three sets of

tests, reported on Table 5, support our hypotheses. When firms redact information from their material contract disclosures, adverse selection increases.

In Table 6 we report the results of our probit analysis, examining the determinants of the decision to redact information. We find that firms are less likely to redact information when they issue long-term debt. This is consistent with the extant literature which finds that firms tend to disclose more information in anticipation of raising capital.

We also find that firms in less (more) competitive industries are less (more) likely to redact information from their material contracts. This result suggests that small firms may choose to redact information to reduce the potential product market effects of disclosing proprietary information. This is consistent with the theoretical literature that argues that competition reduces a firm's propensity to make proprietary disclosures (e.g., Verrecchia, 1990). In light of relatively little empirical evidence regarding the effect of competition on disclosure choices (e.g., Healy and Palepu, 2001), it is also a potentially important result in the empirical literature.

We also find that loss firms are more likely to redact information. Skinner (1997) argues that loss firms are more likely to disclose bad earnings-related news to reduce litigation costs. Our results suggest that firms that suffer losses are more likely to withhold proprietary information from the market. Because the SEC must approve these requests, they are unlikely to trigger litigation. Not surprisingly, we also find that firms that file more exhibits are more likely to redact information.

We recognize that the redaction of material contract information is a choice, and thus there may be systematic differences in the types of firms that redact information. This suggests that there may be a self-selection problem. To address this problem we

employ the self-selection correction model advocated in Heckman (1976). We use our model of the determinants of the decision to redact information to derive an inverse mills ratio, and include this ratio as an explanatory variable in our models of the determinants of adverse selection. The results of this procedure are reported in Table 7.

The first and second columns of Table 7 suggest that controlling for self-selection does not appear to affect the relation between redaction and the adverse selection component of the firm's bid-ask spread or dollar depth. The third column suggests that self-selection does, in part, affect the relations between redaction and share turnover. Overall, after controlling for self-selection, it appears that firms that redact information are penalized through reduced depth and larger adverse selection component.

6.3 Sensitivity Analyses

We investigate the sensitivity of our results to a number of our research design choices. First, theory suggests that disclosure choices like redaction are likely to be related to public debt issuances, as opposed to private debt issuances (e.g., Sengupta, 1998). As we discuss above, our proxy for debt issuances includes both public and private debt issuances. To provide evidence on whether redaction is associated with public debt issuances, we hand-collected data from the firm's registration statements and used the SDC data on public debt issuances to determine whether the firms in our sample issued public debt. We find relatively few instances of public debt being issued. When we replace the debt issuance variable used in the main analysis with a variable that is based on the SDC data, the results on the debt issuance variable become insignificant. These results imply that information redaction is less likely to occur when firms enter into private debt contracts. While this result may seem unusual, note that firms may be

entering into private debt contracts through syndicated loans, which are traded. As such, investors who purchase syndicated debt will not have access to proprietary information. This may motivate firms to redact less.

In addition, we replaced our measure of redaction with a continuous measure and find results qualitatively similar to those we report in Table 6. We replaced our measure of the adverse selection component of the bid-ask spread with the actual bid-ask spread and find that firms that redact information have larger spreads. Finally, we replaced our dollar depth measure with the depth in shares and find qualitatively similar results.

7. Conclusion

In this paper we attempt to relate the disclosure choices firms make with regard to redacting proprietary information from the material contracts filed with their financial statements, with various measures of the severity of the adverse selection problem in trade that involves firm securities. Our predictions are based on the notion that redaction of proprietary information from a firm's material contracts should manifest itself as an increase in the adverse selection component of the firm's bid-ask spread, a reduction in market depth, and a reduction in market turnover.

We find that firms that redact information from their material contracts filings during the fiscal year have a higher adverse selection component of the bid-ask spread, lower quoted dollar depths, and lower monthly turnover. Cumulatively, we interpret the empirical evidence as confirming our prediction that there is a relation between firms' disclosure choices and measures of adverse selection. We also find that small, publicly traded companies are less likely to redact information from their material contract filings

when they issue debt, and more likely to redact information when they are in a competitive industry or suffering losses.

These results imply that small firms in competitive industries elect to redact proprietary information from their material contracts. The benefit of redaction is that these firms avoid the dissemination of proprietary information, which is harmful in their product markets. The cost of redaction is that it results in increased adverse selection, which should be associated with that part of the firm's cost of capital that arises from information asymmetry between the firm and its shareholders, and/or among investors. Presumably, these firms elect not to disclose because they are willing to trade off the former against the latter.

References

- Botoson, C. 1997. Disclosure Level and the Cost of Equity Capital. *The Accounting Review* (July): 323-349.
- Botoson, C., and C. Frost. 1998. Regulation, Disclosure, and Market Liquidity. *Working paper- Univeristy of Utah*.
- Carter, M. and B. Soo. 1999. The relevance of Form 8-K Reports. *Journal of Accounting Research* 37 (Spring): 119-132.
- Callahan, C. , C. Lee, and T. Yohn. 1996. Accounting Information and Bid-Ask Spreads. *Accounting Horizons* (December): 50-60.
- Christie, William G. and Roger D. Huang, 1994, Market structures and liquidity: A transactions data study of exchange listings, *Journal of Financial Intermediation*, 300-326.
- Coller, M. and Y. Yohn, 1997. Management forecasts and information symmetry: An examination of bid-ask spreads. *Journal of Accounting Research* 35, 181-191.
- Darrough, M., and N. Stoughton. 1990. Financial Disclosure Policy in an Entry Game. *Journal of Accounting and Economics* 12: 219-243.
- Diamond, D., and R. Verrecchia. 1991. Disclosure, Liquidity and the Cost of Capital. *Journal of Finance* 46: 1325-1359.
- Easley, D., N. Kieffer, M. O'Hara, and J. Paperman. 1996. Liquidity, Information, and Infrequently Traded Stocks. *Journal of Finance*, (September 1996): 1405-1436.
- Frankel, R., M. McNichols, and P. Wilson. 1995. Discretionary Disclosure and External Financing. *The Accounting Review* 70: 135-150.
- Glosten, L.R. and L.E. Harris. 1988. Estimating the Components of the Bid-ask Spread. *Journal of Financial Economics* 21: 123-142.
- Healy, P. M. and K.G. Palepu. 2001. Information Asymmetry, Corporate disclosure, and the Capital markets: A Review of the Empirical Disclosure Literature. *Journal of Accounting and Economics* 31: 405-440.
- Healy, P., A. Hutton, and K. Palepu. 1999. Stock Performance and Intermediation Changes Surrounding Sustained Increases in Disclosure. *Contemporary Accounting Research* (fall): 485-520.

- Heckman, J. 1976. The Common Structure of Statistical Models of Truncation, Sample Selection, and Limited Dependent Variables and a Simple Estimator for Such Models. *Annals of Economic and Social Measurement*, 475-492.
- Heflin, F. and K.W. Shaw. 2001. Adverse selection, inventory-holding costs, and depth, *Journal of Financial Research* 24, 65–82.
- Huang, Roger D. and Hans R. Stoll, 1996, Dealer versus auction markets: A paired comparison of execution costs on NASDAQ and the NYSE, *Journal of Financial Economics* 41, 343-357.
- Jaffe, J. and R. Winkler. 1976. Optimal speculation Against Efficient Markets. *Journal of Finance*, 31 (March):
- Lang, M., and R. Lundholm. 1993. Cross-sectional Determinants of Analyst Ratings of Corporate Disclosures. *Journal of Accounting Research* 31: 246-271.
- Lang, M., and R. Lundholm. 1996. Corporate Disclosure Policy and Analyst Behavior. *The Accounting Review* 71: 467-492.
- Lee, C. and M. Ready. 1991. Inferring trade direction from intraday data. *Journal of Finance* 46, 733–46.
- Lee, C., B. Muckalow, and M. Ready. 1993. Spreads, Depths, and the Impact of Earnings Information: An Intraday Analysis. *Review of Financial Studies*, volume 6 (1): 345-374.
- Leuz, C., and R. Verrecchia. 2000. Economic Consequences of Increased Disclosure. *Journal of Accounting Research* 38 (Supplement): 91-124.
- Rogers, J.L. 2005. Disclosure Quality and Management Trading Incentives. Unpublished Dissertation. University of Pennsylvania.
- Sengupta, P. 1998. Corporate Disclosure Quality and the Cost of Debt. *The Accounting Review* (October): 459-474.
- Skinner, D. 1997. Earnings Disclosures and Stockholder Lawsuits. *Journal of Accounting and Economics* 23, 249-283.
- Stoll, H. 1978. The Supply of Dealer Services in Securities Markets. *Journal of Finance*, (September 1978): 1133-1151.
- Verrecchia, R. 1983. Discretionary Disclosure. *Journal of Accounting and Economics* 5: 179-194.
- Verrecchia, R. 1990. Endogenous Proprietary Costs Through Firm Interdependence.

Journal of Accounting and Economics 12: 245-251.

Verrecchia, R. 2001. Essays on Disclosure. *Journal of Accounting and Economics*, 32: 97-180.

Welker, M. Disclosure Policy, Information Asymmetry, and Liquidity in Equity Markets. *Contemporary Accounting Research* (Spring): 801-827.

Weston, J.P. 2001. Competition on the NASDAQ and the Growth of Electronic Communications Networks. Working paper – Rice University.

Table 1
Sample Selection

Firms on CRSP traded on NYSE AMEX or NASDAQ and with MVE between \$50 - \$100 million as of Dec 31, 2001		671
Less:		
Firms in the banking industry	56	
Firms missing 10 K data on Lexis/Nexis or firms with missing exhibit lists	40	
Non-financial firms on CRSP with MVE between 50-100 million that traded on NYSE, NASDAQ, or AMEX and have 10k data		575
Less :		
Firms that did not file any exhibits in fiscal 2001	125	
Firms with sufficient data to compute turnover proxies		450
Less		
Firms with missing TAQ data ¹⁶	23	
Firms with data to compute adverse selection and moral hazard proxies		427

¹⁶ These 23 firms are included in the turnover analyses, as they have sufficient data to calculate our turnover metric.

Table 2

Industry Composition of the Sample

Two Digit SIC Code	Industry Name	Number of firms
13	Oil and Gas Extraction	17
20	Food and Kindred Products	6
28	Chemicals and Allied Products	37
33	Primary Metal industries	10
35	Industrial Machinery and Equipment	23
36	Electronic and Other Electronic Equipment	31
37	Transportation Equipment	7
38	Instruments and Related Products	38
48	Communications	14
49	Electric, gas, and sanitary services	10
50	Wholesale Trade – Durable Goods	8
51	Wholesale Trade- Non Durable Goods	12
58	Eating and Drinking places	7
59	Miscellaneous retail	8
61	Non-Depository Credit Institutions	6
62	Security and Commodity brokers	5
67	Holding and other investment offices	6
73	Business Services	84
80	Health Services	9
87	Engineering and management services	15
---	Firms in industries with fewer than 5 firms	97
	Total	450

Table 3

Descriptive Information on the types of Exhibits filed by the firms in our sample

Panel A: Exhibits filed without any redacted information (for the 684 firms that have 10k information available on Lexis/nexis)

	Total number of exhibits filed in fiscal year 2001 for the firms in our sample	Average number of exhibits filed by firm	Maximum number of exhibits filed by a firm in our sample
Debt related	641	1.42	22
Employment (option plans, offer letters, severance etc..)	1035	2.30	20
Asset Purchase	37	0.08	3
Purchase/sale of inventory or services	109	0.25	12
License	83	0.18	5
Merger related	20	0.04	4
Leases	191	0.42	9
Equity related disclosures	386	0.86	33
Other	799	1.77	47
Total	3301	7.33	

Table 3

Descriptive Information on the types of Exhibits filed by the firms in our sample

Panel B: Exhibits filed in which there was information redacted (for the 684 firms that have 10k information available on Lexis/nexis)

	Total number of exhibits filed in fiscal year 2001 with redacted info for the firms in our sample	Average number of exhibits filed with redacted info by firm	Maximum number of exhibits with redacted info filed by a firm in our sample
Debt related	7	0.02	5
Employment (option plans, offer letters, severance etc..)	7	0.02	2
Asset Purchase	3	0.01	1
Purchase/sale of inventory or services	30	0.07	9
License	39	0.09	4
Merger related	0	0	0
Leases	0	0	0
Equity related disclosures	8	0.02	3
Other	105	0.23	16
Total	199	0.44	
Number of firms filing at least one request to redact data from an exhibit in 2001	74		
Number of firms that had filed a request to redact data at some point as per their 2001 10K	122		

Table 4

Descriptive Statistics – All Firms in Final Sample

Variable	Q1	Mean (Median)	Q3	Std Dev
Redactdum	0.00	0.16 (0.00)	0.00	0.37
Debt_Issue	0.00	0.44 (0.00)	1.00	0.49
Equity_Issue	0.00	0.18 (0.00)	0.00	0.38
Hindex	11.5	226.5 (191.5)	334.5	130.0
ROA	-0.35	-0.24 (-0.04)	0.03	0.68
Loss	0.00	0.62 (1.00)	1.00	0.48
LN MVE	10.91	11.18 (11.18)	11.41	0.52
LN(Num of Exib)	1.10	1.57 (1.60)	2.30	0.93
Adv_Select	0.11	0.19 (0.14)	0.20	0.16
\$Depth	21.5	44.0 (34.6)	56	31.1
Monthly_Turnover	0.03	0.08 (0.06)	0.10	0.08
NYSE	1.00	0.78 (1.00)	1.00	0.41
AMEX	0.00	0.08 (0.00)	0.00	0.27
LN Price	1.15	1.62 (1.61)	2.11	0.74
Number of Firms – 450 (except for \$depth and adv-selection variables in which case it is 427)				

Variable Definitions

Redactdum – An indicator variable set equal to one if the firm filed a requests for confidential treatment for the fiscal year 2001, zero otherwise.

Debt_Issue - Indicator variable that is 1 if the firm issued debt during fiscal 2001 (COMPUSTAT data item 111) , 0 otherwise.

Equity_Issue – Indicator variable that is 1 if the firm issued equity during fiscal 2001 (as per the SDC database), 0 otherwise.

Hindex – The rank of the industries Herfindahl index. The Herfindahl index calculated as the sum of the squared market share of each publicly traded company in a particular

the 2 digit SIC code. Market share is calculated as the sales of a particular company divided by the total sales of the SIC code.

ROA – Net income/Assets (CMPUSTAT data items 172 and 6).

Loss – Indicator variable that is 1 if the firm had a loss, 0 otherwise.

Adv_Select - We use the methodology proposed in Glosten and Harris (1988) and the trade identification procedure proposed by Lee and Ready (1991) to calculate the percentage of the spread that is related to adverse selection. We use the in trade and quote data for our sample firms for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

\$Depth – Calculated using the TAQ quote files. We first calculate the dollar depth for an individual trade by adding the number of shares offered at the bid multiplied by the bid price and the number of shares offered at the ask multiplied by the asking price. We divide the resulting sum by 2. The resulting variable is a measure of quoted \$Depth. Finally, we then calculate the median \$depth for each firm/day in our sample for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The final variable is the average of these daily \$depths.

Monthly Turnover – Calculated by dividing the monthly volume of shares traded by the number of shares outstanding for each firm month for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The average monthly turnover for the firm is then determined.

Ln(Num of Exhib) – Calculated as the natural log of the number of exhibits filed in fiscal 2001.

LN MVE – The natural log of the firm's market value of equity (in \$100,000), calculated on December 31, 2001.

NYSE – Indicator that is one if the firm is traded on the New York Stock Exchange, zero otherwise.

AMEX- Indicator variable that is one if the firm is traded on the American stock exchange, zero otherwise.

LnPrice – The natural log of the median price per share for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

Table 5**Regression Results – Spread, Volatility, and Turnover Regressions**

Model 1: $\text{Adv_Select} = \alpha \text{ Intercept} + \beta_1 \text{ RedactDum} + \beta_2 \text{ LnNumofExib} + \beta_3 \text{ LnMVE} + \beta_4 \text{ NYSE} + \beta_5 \text{ AMEX} + \beta_6 \text{ LNPrice} + \varepsilon$

Model 2: $\text{\$Depth} = \alpha \text{ Intercept} + \beta_1 \text{ RedactDum} + \beta_2 \text{ LnNumofExib} + \beta_3 \text{ LnMVE} + \beta_4 \text{ NYSE} + \beta_5 \text{ AMEX} + \beta_6 \text{ LNPrice} + \varepsilon$

Model 3: $\text{MonthlyTurnover} = \alpha \text{ Intercept} + \beta_1 \text{ RedactDum} + \beta_2 \text{ LnNumofExib} + \beta_3 \text{ LnMVE} + \beta_4 \text{ NYSE} + \beta_5 \text{ AMEX} + \beta_6 \text{ LNPrice} + \varepsilon$

		Model 1		Model 2		Model 3
Variable	Pred. Sign	Coefficient (T-Statistic)	Pred Sign	Coefficient (T-Statistic)	Pred Sign	Coefficient (T-Statistic)
Intercept	?	1.00 (14.51)***	?	88.42 (3.86)***	?	-0.57 (-7.87)***
RedactDum	+	0.02 (1.70)**	-	-5.99 (-2.01)**	-	-0.01 (-1.94)**
LnNumofExib	?	-0.001 (-0.32)	?	1.05 (0.93)	?	0.01 (2.83)***
LN MVE	-	-0.06 (-9.57)***	+	-3.65 (-1.79)*	+	0.05 (8.20)***
NYSE	?	-0.30 (-30.66)***	?	-43.89 (-13.46)***	?	0.04 (4.56)***
AMEX	?	0.10 (7.25)***	?	-9.23 (-1.77)*	?	0.01 (0.01)
LN Price	?	0.05 (11.65)***	?	21.20 (13.82)***	?	0.01 (0.01)
Coefficients and T-Stats on Industry indicators are suppressed						
Adjusted R-Squared		83.7%		56.4%		21.6%
Number Obs		427		427		450

*, **, *** Statistically significant at the 10, 5, and 1 percent levels, respectively.

Variable Definitions

Adv_Select - We use the methodology proposed in Glosten and Harris (1988) and the trade identification procedure proposed by Lee and Ready (1991) to calculate the percentage of the spread that is related to adverse selection. We use the in trade and quote data for our sample firms for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

\\$Depth – Calculated using the TAQ quote files. We first calculate the dollar depth for an individual trade by adding the number of shares offered at the bid multiplied by the bid price and the number of shares offered at the ask multiplied by the asking price. We divide the resulting sum by 2. The resulting variable is a measure of quoted \\$Depth.

Finally, we then calculate the median \$depth for each firm/day in our sample for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The final variable is the average of these daily \$depths.

Monthly Turnover – Calculated by dividing the monthly volume of shares traded by the number of shares outstanding for each firm month for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The average monthly turnover for the firm is then determined.

Redactdum – An indicator variable set equal to one if the firm filed a requests for confidential treatment for the fiscal year 2001, zero otherwise.

Ln(Num of Exhib) – Calculated as the natural log of the number of exhibits filed in fiscal 2001.

LN MVE – The natural log of the firm's market value of equity (in \$100,000), calculated on December 31, 2001.

NYSE – Indicator that is one if the firm is traded on the New York Stock Exchange, zero otherwise.

AMEX- Indicator variable that is one if the firm is traded on the American stock exchange, zero otherwise.

LnPrice – The natural log of the median price per share for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

Table 6

Probit regression examining the determinants of the decision to redact information from the material contracts filed with a firm's financial reports

Model 4: $\text{Redactdum} = \alpha \text{ Intercept} + \beta_1 \text{ Equity_Issue} + \beta_2 \text{ Debt_Issue} + \beta_3 \text{ Hindex} + \beta_4 \text{ ROA} + \beta_5 \text{ Loss} + \beta_6 \text{ LnMVE} + \beta_7 \text{ Ln(NumofExib)} + \varepsilon$

Variable	Predicted Sign	Coefficient (Chi_sqr)
Intercept	?	-1.77 (-1.10)**
Equity_Issue	-	0.12 (0.39)
Debt_Issue	-	-0.41 (6.25)***
Hindex	?	-0.002 (-13.36)**
ROA	?	0.05 (0.20)
Loss	?	0.50 (6.21)***
LnMVE	?	0.36 (0.06)
Ln(Num of Exib)	?	0.39 (19.47)***
Pseudo R-Squared		16.2%

Variable Definitions:

Redactdum - Indicator variable that is 1 if the firm redacted information form a disclosure during fiscal year 2001, 0 otherwise.

Debt_Issue - Indicator variable that is 1 if the firm issued debt during fiscal 2001 (COMPUSTAT data item 111) , 0 otherwise.

Equity_Issue – Indicator variable that is 1 if the firm issued equity during fiscal 2001 (as per the SDC database), 0 otherwise.

Hindex – The rank of the industries Herfindahl index. The Herfindahl index calculated as the sum of the squared market share of each publicly traded company in a particular the 2 digit SIC code. Market share is calculated as the sales of a particular company divided by the total sales of the SIC code.

ROA – Net income/Assets (COMPUSTAT data items 172 and 6).

Loss – Indicator variable that is 1 if the firm had a loss, 0 otherwise.

LN MVE – The natural log of the firm's market value of equity (in \$100,000), calculated on December 31, 2001.

Ln(Num of Exhib) – Calculated as the natural log of the number of exhibits filed in fiscal 2001.

Table 7

Regression Results – Spread, Volatility, and Turnover Regressions
with controls for self-selection

Model 1: $\text{Adv_Select} = \alpha \text{ Intercept} + \beta_1 \text{RedactDum} + \beta_2 \text{LnNumofExib} + \beta_3 \text{LnMVE} + \beta_4 \text{NYSE} + \beta_5 \text{AMEX} + \beta_6 \text{LNPrice} + \beta_7 \text{IMILL} + \varepsilon$

Model 2: $\text{\$Depth} = \alpha \text{ Intercept} + \beta_1 \text{RedactDum} + \beta_2 \text{LnNumofExib} + \beta_3 \text{LnMVE} + \beta_4 \text{NYSE} + \beta_5 \text{AMEX} + \beta_6 \text{LNPrice} + \beta_7 \text{IMILL} + \varepsilon$

Model 3: $\text{MonthlyTurnover} = \alpha \text{ Intercept} + \beta_1 \text{RedactDum} + \beta_2 \text{LnNumofExib} + \beta_3 \text{LnMVE} + \beta_4 \text{NYSE} + \beta_5 \text{AMEX} + \beta_6 \text{LNPrice} + \beta_7 \text{IMILL} + \varepsilon$

		Model 1		Model 2		Model 3
Variable	Pred. Sign	Coefficient (T-Statistic)	Pred Sign	Coefficient (T-Statistic)	Pred Sign	Coefficient (T-Statistic)
Intercept	?	1.04 (14.77)***	?	81.53 (3.47)***	?	-0.54 (-7.13)***
Redactdum	-	0.08 (2.34)***	+	-27.92 (-2.51)***	+	0.04 (1.04)
Ln(Num of Exhib)	+	-0.006 (-1.52)	-	3.05 (2.08)**	-	0.005 (1.12)
LN MVE	-	-0.06 (-10.01)***	-	-3.03 (-1.45)	+	0.05 (7.43)***
NYSE	?	-0.31 (-30.47)***	?	-42.89 (-12.95)***	?	0.04 (3.85)***
AMEX	?	0.09 (6.92)***	?	-7.87 (-1.67)*	?	-0.005 (-0.35)
LNPrice	-	0.05 (11.82)***	-	20.58 (13.15)***	-	0.004 (0.87)
IMILL	?	-0.03 (-1.86)*	?	13.15 (2.08)**	?	-0.03 (-1.61)
Coefficients and T-Stats on industry indicator variables are suppressed						
Adjusted R-Squared		83.4%		55.1%		20.8%
Number Obs						

*, **, *** Statistically significant at the 10, 5, and 1 percent levels, respectively.

Variable Definitions

Adv_Select - We use the methodology proposed in Glosten and Harris (1988) and the trade identification procedure proposed by Lee and Ready (1991) to calculate the percentage of the spread that is related to adverse selection. We use the in trade and quote data for our sample firms for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

\$Depth – Calculated using the TAQ quote files. We first calculate the dollar depth for an individual trade by adding the number of shares offered at the bid multiplied by the bid price and the number of shares offered at the ask multiplied by the asking price. We divide the resulting sum by 2. The resulting variable is a measure of quoted \$Depth. Finally, we then calculate the median \$depth for each firm/day in our sample for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The final variable is the average of these daily \$depths.

Monthly Turnover – Calculated by dividing the monthly volume of shares traded by the number of shares outstanding for each firm month for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year. The average monthly turnover for the firm is then determined.

Redactdum – An indicator variable set equal to one if the firm filed a requests for confidential treatment for the fiscal year 2001, zero otherwise.

Ln(Num of Exhib) – Calculated as the natural log of the number of exhibits filed in fiscal 2001.

LN MVE – The natural log of the firm's market value of equity (in \$100,000), calculated on December 31, 2001.

NYSE – Indicator that is one if the firm is traded on the New York Stock Exchange, zero otherwise.

AMEX- Indicator variable that is one if the firm is traded on the American stock exchange, zero otherwise.

LnPrice – The natural log of the median price per share for the 15 month period beginning the first day of fiscal year 2001 and ending 3 months after the end of the fiscal year.

IMILL - The inverse mills ratio calculated from model 1 Table 7 panel A.